Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for simulation modeling where the simulation model includes individual blocks in a block diagram structure wherein each of the individual blocks include equation sets of a physical model, comprising:

configuring said blocks in a block diagram structure;

utilizing commercial simulation software to solve said equation sets of said blocks;

ordering said blocks in said block diagram structure to allow for waveform relaxation of sets of variables of said blocks, including

mixing a reference input signal and an error signal to generate non-relaxed variables,

converting the non-relaxed variables into input relaxation variables through waveform relaxation,

processing the input relaxation variables with a high fidelity plant model,

generating non-relaxed output variables with the high fidelity plant model,

converting the non-relaxed output variables into output relaxation variables through waveform relaxation, and

providing the output relaxation variables to a low order controller that generates the error signal;

~~performing waveform relaxation of said sets of variables of said blocks to generate relaxation variables;~~ and

designing ~~a~~ the low order controller with said blocks to minimize the error signal, ~~and the relaxation variables,~~ wherein the low order controller controls a system for manufacturing.

2. (Previously Presented) The method of claim 1, wherein ordering said blocks in said block diagram structure includes decomposing said block diagram into subsystems.

3. (Previously Presented) The method of claim 1, wherein ordering said blocks in said block diagram structure includes identifying said sets of variables of said blocks.

4. (Previously Presented) The method of claim 1, wherein ordering said blocks in said block diagram structure includes adding a low fidelity model of one of said blocks.

5. (Previously Presented) The method of claim 4, wherein adding said low fidelity model of one of said blocks includes deriving an error signal from an output of said one of said blocks and an output of said low fidelity model.

6. (Previously Presented) The method of claim 5, wherein ordering said blocks in said block diagram structure includes accelerating convergence of said simulation model by processing said error signal.

7. (Previously Presented) The method of claim 1, wherein performing waveform relaxation includes deriving a sparse interconnect matrix.

8. (Previously Presented) The method of claim 7, wherein performing waveform relaxation includes weakly-coupling said equation sets.

9. (Previously Presented) The method of claim 8, wherein utilizing said commercial simulation software includes running said commercial simulation software on a plurality of data processors.

10. (Previously Presented) The method of claim 9, running said commercial software on said plurality of data processors includes waiting until each of said commercial simulation software has completed calculations before transmitting interprocessor communications data.

11. (Original) The method of claim 1, wherein said equation sets change in subsequent iterations of said simulation model.

12. (Original) The method of claim 11, wherein said equation sets increase in fidelity in subsequent iterations of said simulation model.

13. (Previously Presented) The method of claim 1, wherein performing waveform relaxation utilizes Gauss-Jacobi methods.

14. (Previously Presented) The method of claim 1, wherein performing waveform relaxation utilizes Gauss-Seidel methods.

15. (Currently Amended) A computer readable medium having stored thereon instructions which when executed in a computer system, cause the computer system to perform:

configuring said blocks in a block diagram structure;

utilizing commercial simulation software to solve said equation sets of said blocks;

ordering said blocks in said block diagram structure to allow for

waveform relaxation of sets of variables of said blocks, including

mixing a reference input signal and an error signal to generate non-relaxed variables,

converting the non-relaxed variables into input relaxation variables through waveform relaxation,

processing the input relaxation variables with a high fidelity plant model,

generating non-relaxed output variables with the high fidelity plant model,

converting the non-relaxed output variables into output relaxation variables through waveform relaxation, and

providing the output relaxation variables to a low order controller that generates the error signal;

~~performing waveform relaxation of said sets of variables of said blocks to generate relaxation variables;~~ and

designing ~~a~~ the low order controller with said blocks to minimize the error signal, ~~and the relaxation variables,~~ wherein the low order controller controls a system for manufacturing.

16. (Previously Presented) The computer readable medium of claim 15, further having stored thereon computer-readable instructions, which when executed in the computer system for ordering said blocks in said block diagram structure, cause the computer system to perform decomposing said block diagram into subsystems.

17. (Previously Presented) The computer readable medium of claim 15, further having stored thereon computer-readable instructions, which when executed in the computer system for ordering said blocks in said block diagram structure, cause the computer system to perform identifying said sets of variables of said blocks.

18. (Previously Presented) The computer readable medium of claim 15, further having stored thereon computer-readable instructions, which when executed in the computer system for ordering said blocks in said block diagram structure, cause the computer system to perform adding a low fidelity model of one of said blocks.

19. (Previously Presented) The computer readable medium of claim 18, further having stored thereon computer-readable instructions, which when executed in the computer system for adding said low fidelity model of one of said blocks, cause the computer system to perform deriving an error signal from an output of said one of said blocks and an output of said low fidelity model.

20. (Previously Presented) The computer readable medium of claim 19, further having stored thereon computer-readable instructions, which when executed in the computer system for ordering said blocks in said block diagram structure, cause the computer system to perform accelerating convergence of said simulation model by processing said error signal.

21. (Previously Presented) The computer readable medium of claim 15, further having stored thereon computer-readable instructions, which when executed in the computer system for performing waveform relaxation, cause the computer system to perform deriving a sparse interconnect matrix.

22. (Previously Presented) The computer readable medium of claim 21, further having stored thereon computer-readable instructions, which when executed in the computer system for performing waveform relaxation, cause the computer system to perform weakly-coupling said equation sets.

23. (Previously Presented) The computer readable medium of claim 22, further having stored thereon computer-readable instructions, which when executed in the computer system for utilizing said commercial simulation software, cause the computer system to perform running said commercial simulation software on a plurality of data processors.

24. (Previously Presented) The computer readable medium of claim 23, further having stored thereon computer-readable instructions, which when executed in the computer system for running said commercial software on said plurality of data processors, cause the computer system to perform waiting until each of said commercial simulation software has completed calculations before transmitting interprocessor communications data.

25. (Previously Presented) The computer readable medium of claim 15, wherein said equation sets change in subsequent iterations of said simulation model.

26. (Previously Presented) The computer readable medium of claim 25, wherein said equation sets increase in fidelity in subsequent iterations of said simulation model.

27. (Previously Presented) The computer readable medium of claim 15, wherein performing waveform relaxation utilizes Gauss-Jacobi computer readable mediums.

28. (Previously Presented) The computer readable medium of claim 15, wherein performing waveform relaxation utilizes Gauss-Seidel computer readable mediums.

29. (Currently Amended) A system for simulation modeling where the simulation model includes individual blocks in a block diagram structure wherein each of the individual blocks include equation sets of a physical model, comprising:

means for configuring said blocks in a block diagram structure;

means for utilizing commercial simulation software to solve said equation sets of said blocks;

means for ordering said blocks in said block diagram structure to allow for waveform relaxation of sets of variables of said blocks, including

means for mixing a reference input signal and an error signal to generate non-relaxed variables,

means for converting the non-relaxed variables into input relaxation variables through waveform relaxation,

means for processing the input relaxation variables with a high fidelity plant model,

means for generating non-relaxed output variables with the high fidelity plant model,

means for converting the non-relaxed output variables into output relaxation variables through waveform relaxation, and

means for providing the output relaxation variables to a low order controller that generates the error signal;

~~means for performing waveform relaxation of said sets of variables of said blocks to generate relaxation variables;~~ and

means for designing ~~a~~ the low order controller with said blocks to minimize the error signal, ~~and the relaxation variables,~~ wherein the low order controller controls a system for manufacturing.

30. (Previously Presented) The system of claim 29, wherein the means for ordering said blocks in said block diagram structure include means for decomposing said block diagram into subsystems.

31. (Previously Presented) The system of claim 29, wherein said means for ordering said blocks in said block diagram structure includes means for identifying said sets of variables of said blocks.

32. (Previously Presented) The system of claim 29, wherein said means for ordering said blocks in said block diagram structure includes means for adding a low fidelity model of one of said blocks.

33. (Previously Presented) The system of claim 32, wherein said means for adding said low fidelity model of one of said blocks includes means for deriving an error signal from an output of said one of said blocks and an output of said low fidelity model.

34. (Previously Presented) The system of claim 33, wherein said means for ordering said blocks in said block diagram structure includes means for accelerating convergence of said simulation model by processing said error signal.

35. (Previously Presented) The system of claim 29, wherein said means for performing waveform relaxation includes means for deriving a sparse interconnect matrix.

36. (Previously Presented) The system of claim 35, wherein said means for performing waveform relaxation includes means for weakly-coupling said equation sets.

37. (Previously Presented) The system of claim 36, wherein said means for utilizing said commercial simulation software includes means for running said commercial simulation software on a plurality of data processors.

38. (Previously Presented) The system of claim 37, wherein said means for running said commercial software on said plurality of data processors includes means for waiting until each of said commercial simulation software has completed calculations before transmitting interprocessor communications data.

39. (Previously Presented) The system of claim 29, wherein said equation sets change in subsequent iterations of said simulation model.

40. (Previously Presented) The system of claim 39, wherein said equation sets increase in fidelity in subsequent iterations of said simulation model.

41. (Previously Presented) The system of claim 29, wherein said means for performing waveform relaxation utilizes Gauss-Jacobi systems.

42. (Previously Presented) The system of claim 29, wherein said means for performing waveform relaxation utilizes Gauss-Seidel systems.